Claims 1, 3 through 6, 8 through 10, 15, 16, 19, 20, 22, and 43 through 48 were finally rejected under §102 as anticipated by the Achiwa et al. reference[1]. Claims 7 and 21 were rejected under §103 as unpatentable over the Achiwa et al. reference in view of the Kramer reference.[2]

Applicants respectfully traverse the rejection, on the grounds that the rejection is based on a misinterpretation or a misapplication of the Achiwa et al. reference.

As previously argued,[3] claim 1 requires that the non-volatile memory, upon which the claimed method is performed, has a plurality of erase units, each erase unit including a plurality of programming units arranged in a sequence. The method of claim 1 requires the grouping of the programming units within a first erase unit into a plurality of groups of programming units arranged in a sequence. The writing steps recited in claim 1 are then performed according to this defined arrangement of the physical constituents of the non-volatile memory, in connection with the recited arrangement of logical units and logical sub-units in the claim.

Claim 1 and its dependent claims were rejected as anticipated by the Achiwa et al. reference. In finding claim 1 to be anticipated, the Examiner found that the "plurality of individually erasable physical blocks" correspond to the non-volatile memory having a plurality of erase units recited in claim 1.[4] The Examiner also applied the "plurality of physical blocks (1110)" of the Achiwa et al. reference against the plurality of programming units arranged in a sequence, recited in claim 1, because "a physical block comprises a plurality of memory cells that can be programmed with desired data".[5] The Office Action goes on to apply the operation described in the Achiwa et al. reference against the recited method steps in the claims, considering the "physical blocks" of the Achiwa et al. reference as the programming units of claim 1.

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[1] U.S. Patent No. 5,737,742, issued April 7, 1998 to Achiwa et al.

[2] U.S. Patent No. 6,182,239 B1, issued January 30, 2001 to Kramer.

[3] *See* Amendment of May 18, 2006.

[4] Office Action of June 12, 2006, page 3, *citing* Achiwa et al., *supra,* abstract.

[5] *Id., citing* Achiwa et al., *supra,* Figure 2.

Applicants submit that this application of the Achiwa et al. reference against the claims is in error. In this regard, Applicants submit that the physical blocks of the Achiwa et al. reference cannot correspond both to the erase units and also to the programming units recited in claim 1. As stated in the claim, and as discussed above, claim 1 requires that each erase unit includes a plurality of programming units arranged in a sequence. According to claim 1, an erase unit is therefore a different thing than a programming unit; specifically, each erase unit of the claimed system includes a plurality of programming units.

Accordingly, the final rejection of claim 1 is therefore necessarily in error, because it is based on the application of the physical block of the Achiwa et al. memory as both the erase unit and also as the programming unit. Not only is this interpretation of the reference inconsistent with itself, but this interpretation also necessarily means that one of the limitations of claim 1 is not met by the reference – specifically, this interpretation of the Achiwa et al. reference necessarily negates a finding that the reference discloses that each erase unit includes a plurality of programming units arranged in a sequence, as required by the claim.

If the Achiwa et al. reference were properly interpreted, however, this interpretation would readily illustrate the differences between the reference and the claimed method. It is clear from the teachings of the Achiwa et al. reference itself that its physical blocks correspond to erase units, rather than programming units. For example, the reference refers to its physical blocks as "individually erasable",[6] and teaches that these physical blocks are "classified according to erasure count",[7] connoting that each physical block has its own erasure count, which applies to the physical block as a whole. In contrast, the erase unit of claim 1 corresponds to a physical block of a non-volatile memory, which "is typically the smallest unit of erase".[8] And the specification describes a "page" within a physical block as "the smallest unit of programming",[9] so that the multiple pages within a block are an example of a plurality of programming units included in an erase unit, as recited in claim 1. Accordingly, proper consideration of the Achiwa et al. reference would apply its physical blocks against the element of the erase units of claim 1. This interpretation of the Achiwa et al. reference necessarily leads to a finding that the reference lacks teachings regarding the writing steps of claim 1, and therefore falls short of the requirements of claim 1. For this reason, Applicants respectfully submit that claim 1 and its dependent claims are in fact novel over the Achiwa et al. reference.

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[6] Achiwa et al., *supra,* abstract.

[7] *Id.,* column 4, lines 21 through 25.

[8] Specification, *supra,* paragraph [0040].

[9] *Id.*

Furthermore, as previously argued, the method of claim 1 provides the important advantage of efficiently permitting out-of-sequence write operations within a given physical block (erase unit), even in a flash memory of a type (*e.g.,* NAND memory) in which out-of-sequence write operations are prohibited.[10] If one were to consider the physical blocks of the Achiwa et al. reference as corresponding to the programming units of the claim (as was considered by the Examiner), neither this advantage nor the operation of method 1 itself would make sense, because each instance of programming would be carried out on an entire block.

Because the rejection of claim 1 is based on a misinterpretation and misapplication of the Achiwa et al. reference, and because the rejection of all of the claims dependent on claim 1[11] incorporates these erroneous findings, Applicants respectfully submit that the final rejection of claim 1 and its dependent claims 3 through 6, 8 through 10, and 43 through 45, is in error. Reconsideration is requested.

Independent apparatus claim 22 similarly recites a non-volatile memory that includes a plurality of erase units that each includes a plurality of programming units. The system of claim 22 also includes means for controlling the writing of contents into the memory according to groups of programming units within the erase units, such groups arranged in sequence, with the writing of these contents according to a sequence of operations recited in the claim.

Claim 22 and its dependent claims were rejected as anticipated by the Achiwa et al. reference on the same grounds as discussed above relative to claim 1.[12] To summarize, the Examiner found that the "plurality of individually erasable physical blocks" of the reference correspond to the non-volatile memory having a plurality of erase units of the claim,[13] while also finding that the "plurality of physical blocks (1110)" of the reference also correspond to the claimed plurality of programming units arranged in a sequence.[14]

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[10] Specification, *supra,* paragraph [0050].
[11] Including the §103 rejection of claim 7.

Applicants also submit that this application of the Achiwa et al. reference against claim 22 and its dependent claims is in error. The physical blocks of the Achiwa et al. reference cannot correspond both to the erase units and also to the programming units recited in claim 22, because the claim expressly requires that each erase unit includes a plurality of programming units arranged in a sequence. The memory system of claim 22 therefore considers its erase unit as different than a programming unit, because it requires each of its erase units as including a plurality of programming units. Applicants therefore traverse the final rejection of claim 22 because this reading of the Achiwa et al. reference is incoherent.

Furthermore, even if one accepts the rationale of the Examiner in applying the Achiwa et al. reference in this manner, this rationale necessarily results in a limitation of claim 22 not being met – namely that each erase unit includes a plurality of programming units arranged in a sequence. If the physical block of the reference is both the erase unit and the programming unit, then it is impossible for the reference to teach an erase unit that includes a plurality of programming units, as required by the claim.

Applicants submit that proper application of the Achiwa et al. reference against claim 22 clearly illustrates the differences between the reference and the claim. As discussed above, the skilled reader would properly interpret the Achiwa et al. reference as describing that its physical blocks correspond to erase units, rather than to programming units, based on the description of its physical blocks as "individually erasable",[15] and as "classified according to erasure count".[16] Referring to claim 22, the recited erase unit more properly corresponds to a physical block,

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[12] Office Action, *supra,* page 8.

[13] Office Action of June 12, 2006, page 3, *citing* Achiwa et al., *supra,* abstract.

[14] *Id., citing* Achiwa et al., *supra,* Figure 2.

[15] Achiwa et al., *supra,* abstract.

[16] *Id.,* column 4, lines 21 through 25.

"typically the smallest unit of erase",[17] while the programming units of the claim more properly correspond to pages ("the smallest unit of programming"[18]) within each block. The more reasonable interpretation of the Achiwa et al. reference would apply its physical blocks against the element of the erase units of claim 1. But this interpretation would require a finding that the Achiwa et al. reference fails to disclose the remainder of claim 22, and thus cannot anticipate this claim or its dependent claims. For this reason, Applicants respectfully submit that claim 22 and its dependent claims are also novel over the Achiwa et al. reference.

Therefore, as in the case of claim 1, because the rejection of claim 22 is based on a misinterpretation and misapplication of the Achiwa et al. reference, and because the rejection of all of the claims dependent on claim 22, including dependent claim 21 which was rejected under §103, is based on this erroneous rejection of claim 22, Applicants respectfully traverse the final rejection of claim 1 and its dependent claims 19 through 21, and 43 through 48 on the grounds that the rejection is in error. Reconsideration is requested.

For these reasons, Applicants respectfully submit that the claims now in this case are in condition for allowance. Reconsideration of this application is therefore respectfully requested.

Respectfully submitted,

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[17] Specification, *supra,* paragraph [0040].
[18] *Id.*